Bowling, T. A., and R. J. Sauer. 1975. A taxonomic revision of the crab spider genus *Coriarachne* (Araneida, Thomisidae) for North America North of Mexico. J. Arachnol. 2:183-193.

A TAXONOMIC REVISION OF THE CRAB SPIDER GENUS *CORIARACHNE* (ARANEIDA, THOMISIDAE) FOR NORTH AMERICA NORTH OF MEXICO[1]

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ABSTRACT

The four known species of the genus *Coriarachne* that occur in Canada and the United States are described and illustrated. A key to species and distribution maps are provided. *Coriarachne nakina* Gertsch 1953 is synonymized under *Coriarachne brunneipes* Banks 1893, and *Coriarachne aemula* (O. P.-Cambridge) 1898 is synonymized under *Coriarachne versicolor* Keyserling 1880.

INTRODUCTION

The purpose of this revision is to aid in the identification of spiders of the thomisid genus *Coriarachne* from Canada and the United States. To this end keys, illustrations, and descriptions are provided. Descriptions are limited to include only morphological characters that are important to species delimitation. Only important and significant literature citations are included here. For a complete bibliography biologists who are interested are referred to works by Gertsch (1939, 1953), Roewer (1954), and Bonnet (1956).

A small, but world-wide genus, *Coriarachne* is found in boreal and temperate regions. The greatest number of species are found in North America where there are four. *Coriarachne depressa* (C. L. Koch) is the only species recorded from Europe. Little is known of the Oriental fauna except for *C. fulvipes* (Karsch), which was recorded from Japan by Yaginuma (1970), and *C. nigrostriata* Simon is cited by Bonnet (1956), from Indochina.

Spiders of the genus *Coriarachne* are rather slow-moving and robust with the typical crab-like appearance characteristic of the subfamily Thomisinae. As with the rest of the subfamily, species of *Coriarachne* wait to ambush their prey rather than actively pursuing it. They are found almost exclusively on tree bark, wooden fence posts and the like where their color camouflages them. Often these spiders will congregate under loose bark, leaf litter, or similar situations to spend the winter either in the adult or penultimate stage (Jennings, 1972; Holmquist, 1926; Kaston, 1948; Lowrie, 1948).

[1] Journal article No. 6704, Agricultural Experiment Station, Michigan State University.

This review deals primarily with species found in Canada and the United States, although it likely will also identify any species of *Coriarachne* from Mexico. All locality records included here were confirmed by examination of specimens. No records from the literature were relied upon. Common anatomical terms used can be defined by referring to Kaston (1948), Schick (1965), and Figs. 1-3. All measurements were based on at least twenty-five individuals of each sex for each species.

Genus *Coriarachne* Thorell

Coriarachne Thorell, 1870, On European spiders, N. Act. reg. Soc. Sci. Uppsala (3)7:186. Type species: *C. depressa* (C. L. Koch), designated by Thorell, 1870.

Coriarachne, Gertsch, 1939, Bull. Amer. Mus. Nat. Hist. 76:277.

Bassania P.-Cambridge, O., 1898, Biol. Cent.-Amer., Arachnida, Araneida, 1:249. (preoc.) Type species: *B. aemula* P.-Cambridge, O., designated by O. P.-Cambridge, 1898.

Bassaniana Strand, 1928, Miscellanea nomenclatorica et palaeontologica, I-II, Arch. Naturg. 92A(8):30. (n. Nov.)

Platyxysticus Gertsch, 1932, Amer. Mus. Novit. 563:1. Type species: *C. versicolor* Keyserling, designated by Gertsch, 1932.

Description—Carapace as broad or slightly broader than long, strongly flattened, clothed with long thin setae or shorter filiform to subspatulate setae; cephalic sutures very obvious; front vertical and very low; color, mottled with yellow, white, dark brown, and russet. Eyes: anterior eye row straight to modestly recurved when viewed from front; posterior eye row more strongly recurved when viewed from above; median ocular area (MOA) as broad as or slightly broader than long; lateral eyes larger than medians; posterior median eyes (PME) closer to anterior lateral eyes (ALE) than posterior lateral eyes (PLE); lateral eye tubercles discrete, not confluent.

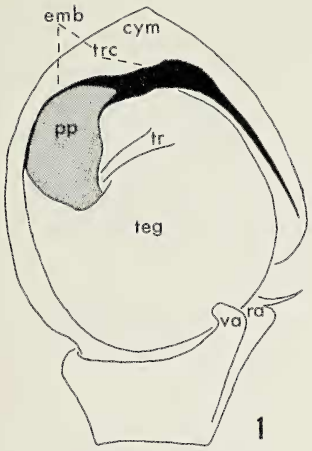
Legs: color similar to carapace; terminal segments lighter than basal segments; legs I and II subequal; III and IV also subequal; moderately stout, more robust in females than males.

Abdomen: colored like cephalothorax but usually lighter in overall appearance; white patches may form indistinct transerve bands. Abdominal sulci, a pair of elongate grooves or with two or three pairs of shallow pits; venter lightly mottled, overall a dirty white.

Male palpus: tibia broader than long, with strongly developed ventral and retrolateral apophyses; retrolateral apophysis often with a terminal spur; cymbium about as broad as long; tegulum either circular or slightly longer than broad; tegular surface smooth except for a small tegular ridge; embolus with pars pendula broad basally, narrowing apically; truncus usually evenly arched, sometimes terminating in a short spiral.

Epigynum: atrium indistinct; septum subtriangular to parallel sided; spermathecae somewhat kidney-shaped with numerous folds and occasionally scattered pits; copulatory tubes variable in length.

Figs. 1-9.—Species of *Coriarachne*: 1, male palp: cym, cymbium; emb, embolus; pp, pars pendula; ra, retrolateral apophysis; teg, tegulum; tr, tegular ridge; trc, truncus; va, ventral apophysis; 2, female epigynum: ms, median septum; 3, internal view of epigynum: spr, spermathecae; ct, copulatory tubes; 4, *C. floridana* Banks, male palp, ventral view; 5, *C. brunneipes* Banks, male palp, ventral view; 6, *C. versicolor* Keyserling (lectotype), male palp, ventral view; 7, *C. versicolor* Keyserling, male palp, ventral view; 8, *C. utahensis* (Gertsch), male palp, ventral view; 9, *C. versicolor* × *utahensis*, male palp, ventral view.



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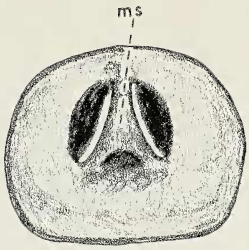

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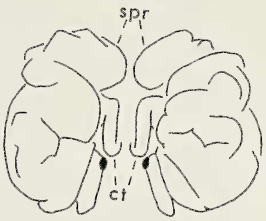

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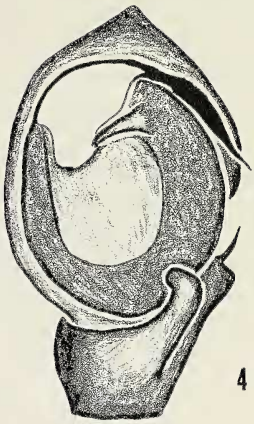
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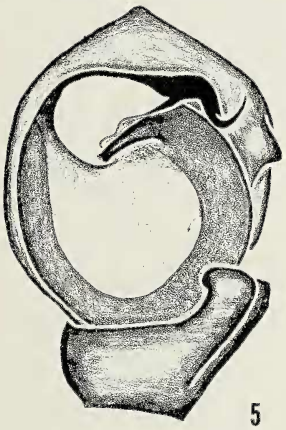
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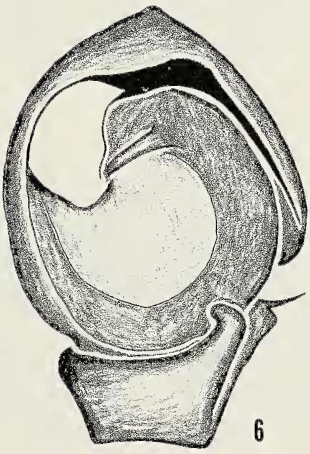
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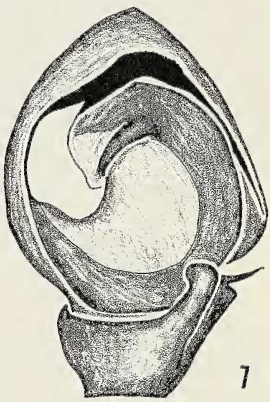
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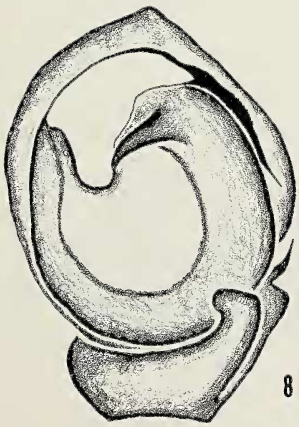
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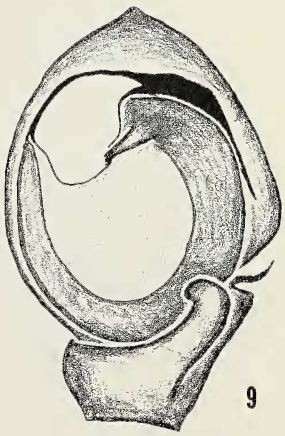
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Diagnosis and comments—*Coriarachne* can be separated from all other North American thomisid genera by the accentuated flatness of the carapace and by the anterior eye row being either straight or slightly recurved.

Of the nine genera of the subfamily Thomisinae in Canada and the United States, the discrete lateral eye tubercles of *Coriarachne* separate if from *Misumena*, *Misumenoides*, and *Misumenops*. *Tmarus* has a distinctive abdominal protuberance and a sloping front. Both *Synema* and *Diaea* have rather shiny and very convex carapaces. In addition, they are usually more brightly colored. *Xysticus* and *Ozyptila* are the genera most similar to *Coriarachne*. However, these groups are readily separated by the arched condition of the carapace as it is much flatter in *Coriarachne*. Also *Xysticus* nearly always has a pale median band on the carapace which is lacking in *Coriarachne*.

The structure of the genitalia and accessory organs has proven to be important in the separation of species. In males the terminal segment of the pedipalp serves as an intromittant organ and nearly always has a characteristic structure for each species. The length and shape of the embolus is of primary importance. In *brunneipes*, for example, the embolus is short and spiral-shaped at the apex, while in *versicolor* it is long and relatively straight. In previous works (Gertsch, 1939, 1953), the shape of the septum has been used to separate the females. However, because of its variability, this character has been found to be unreliable, except for *brunneipes* in which the broad and parallel-sided septum is easily recognized. In other species, the length of the copulatory tubes is a much more consistent character.

KEY TO NORTH AMERICAN SPECIES OF *CORIARACHNE* THORELL

1a. Carapace extremely flat, anterior eye row straight, abdominal sulci a pair of elongate grooves, setae setaform, genitalia as in Figs. 5, 16, and 17 . . . . . *brunneipes*

1b. Carapace not so flattened, anterior eye row at least slightly recurved, abdominal sulci two or three pairs of pits, setae not setaform 2

2a(1b). Anterior eye row definitely recurved, anterior legs quite mottled in both sexes, maculations on posterior declivity of female carapace usually well separated, setae on female carapace coarse but not subspatulate, carapace slightly convex 3

2b. Anterior eye row weakly recurved, anterior legs of male only slightly mottled, maculations on posterior declivity of female carapace contiguous or nearly so, setae on female carapace subspatulate, genitalia as in Figs. 4, 10 and 13. . . . . *floridana*

3a(2a). Embolus short, copulatory tubes short, slightly visible if at all between spermathecae (Figs. 8, 12, 15 and 18) . . . . . *utahensis*

3b. Embolus long, copulatory tubes long and easily visible between spermathecae (Figs. 6, 7, 19, 20, 21) . . . . . *versicolor*

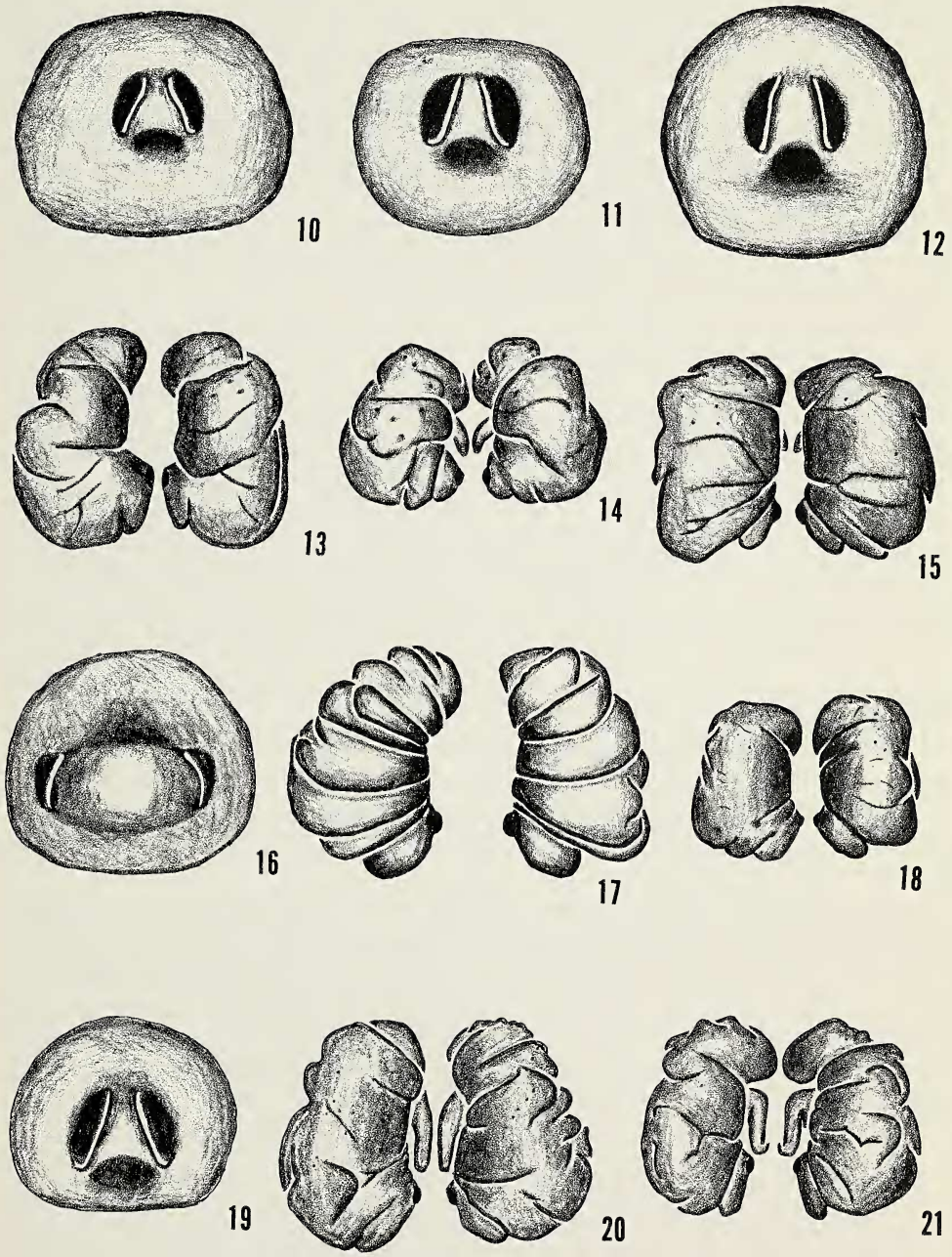
Coriarachne brunneipes Banks

Coriarachne brunneipes Banks, 1893, Jour. N.Y. Ent. Soc. 1:133. Gertsch, 1939, Bull. Amer. Mus. Nat. Hist. 86:410, Figs. 258, 259, 271; 1953, Bull. Amer. Mus. Nat. Hist. 102:461, Figs. 74-76. Roewer, 1954, Katalog der Araneae 2 (Pt. 2):832. Bonnet

1956, Bibliographia Araneorum 2 (Pt. 2):1204. Schick, 1965, Bull. Amer. Mus. Nat. Hist. 129:171, Figs. 253-255.

Platyxysticus brunneipes, Gertsch, 1933, Amer. Mus. Novit. 563:2, Fig. 4.

Coriarachne nakina Gertsch, 1953, Bull. Amer. Mus. Nat. Hist. 102:462, Figs. 69-72. NEW SYNONYM.



Figs. 10-21.–Female epigyna, internal and external views: 10 and 13, *C. floridana* Banks; 11 and 14, *C. versicolor* × *utahensis*; 12, 15 and 18, *C. utahensis* (Gertsch); 16 and 17, *C. brunneipes* Banks; 19 (lectotype), 20 (lectotype) and 21, *C. versicolor* Keyserling.

Type–Male and female syntypes of *C. brunneipes* from Olympia, Washington in Museum of Comparative Zoology, examined. Types of *nakina* are deposited in the Royal Ontario Museum and are from the following locations: male holotype, Attawapiskat, Ontario; female allotype, Nakina, Ontario; female paratypes, Lake Abitibi, Ontario; all were examined.

Male–Total length, 3.83-6.33 mm, mean 5.25 mm: cephalothorax length, 2.00-3.08 mm, mean 2.47 mm; width, 1.92-3.00 mm, mean 2.45. Carapace extremely flat, clothed with long setaform spines, uniform dark reddish brown occasionally broken by a dull yellow or white patch. Anterior eye row straight or very slightly recurved. Legs concolorous with carapace, distal segments lighter than basal segments. Dorsum of abdomen mottled with brown, black, yellow, and white. Sulci an elongate pair of grooves. Venter like dorsum only lighter. Palp as in Fig. 5.

Female–Total length, 6.25-11.17 mm, mean, 8.24 mm; cephalothorax length, 2.32-4.08 mm, mean 3.25 mm; width, 2.36-4.04 mm, mean 3.37 mm. Coloration similar to male, sightly lighter overall. Epigynum as in Figs. 16, 17.

Range–Western United States from Rocky Mountains to Pacific coast, in Canada from British Columbia eastward to northern Ontario (see Map 1).

Localities–*Ontario*: Lake Abitibi; Nakina; Attawapiskat. *Manitoba*: Telford; Picnic Bog. *Alberta*: Banff. *Mackenzie*: Fort Smith. *British Columbia*: Burnaby Island; Queen Charlotte Island; Langford; Terrace; Victoria, Vancouver Island; Williamshead. *Washington*: Island Co.; King Co; San Juan Co.; Snohomish Co.; Mason Co.; Thurston Co.; Yakima Co.; Cottage Lake; Tomino. *Oregon*: Josephine Co.; Lane Co.; Multnomah Co.; Polk Co.; Douglas Co.; Benton Co; Deschutes Co.; Jackson Co.; Columbia Co.; Yamhill Co.; Klamath Co.; Marion Co.; Wheeler Co.; Clackamas Co. *California*: Sonoma Co.; Siskiyou Co.; Santa Cruz Col; Mono Co.; Eldorado Co.; Yosemite National Park. *Colorado*: Gunnison Co.; El Paso Co. *Idaho*: Bear Lake Co. *Wyoming*: Yellowstone National Park; Sublette Co. *Nevada*: Elko Co.; Clark Co.; Charleston Mtns. *Arizona*: White Mtns. *Alaska*: Haines.

Diagnosis and comments–*Coriarachne brunneipes* is easily distinguished from the other species by its relatively uniform color and extremely flattened carapace. Also characteristic of this species is the semi-coiled appearance of the embolus of the male and the extremely wide septum of the female. Both of these characters show similarity to the European species *C. depressa.*

Gertsch (1953) described specimens from Ontario as *C. nakina* based almost entirely on the slightly longer than broad carapace as opposed to *brunneipes* which is slightly broader than long. He also mentions small differences in the male palp. Subsequent examination has shown these characters to vary and appear in specimens of *brunneipes* throughout the range of the species. In addition, *brunneipes* is now known to range eastward to Ontario. For these reasons *C. nakina* Gertsch 1953 is synonymized under *C. brunneipes* Banks 1893.

Coriarachne floridana Banks

Coriarachne floridana Banks, 1896, Trans. Amer. Ent. Soc. 23:71. Gertsch, 1939, Bull Amer. Mus. 76:409, Figs. 256, 257, 270; 1953, Bull. Amer. Mus. 102:461, Figs. 65, 66. Roewer, 1954, Katalog der Araneae 2 (Pt. 2):832. Bonnet, 1956, Bibliographia Araneorum 2, (Pt. 2):1206.

Platyxysticus floridana, Gertsch, 1932, Amer. Mus. Novit. 563:2. Fig. 3.

Type–Male and female syntypes from Punta Gorda, Florida in the Museum of Comparative Zoology, examined.

Male–Total length, 3.42-5.25 mm, mean, 4.48 mm: cephalothorax length, 1.64-2.64 mm, mean, 2.26 mm; width, 1.72-3.00 mm, mean, 2.53 mm. Carapace mottled with brown, yellow, and white; anterior eye row very weakly recurved, posterior eye row more strongly recurved. Legs same color as carapace with an evenly tawny-colored stripe on the ventral surface. Abdomen with irregular maculations of dark brown, yellow, and white. White maculations may appear as irregular transverse bands. Venter of same color but more diffuse pattern. Palp as in Fig. 4.

Female–Total length, 4.92-7.92 mm, mean 6.19 mm: cephalothorax length, 2.20-3.16 mm, mean, 2.71 mm; width, 2.56-3.48 mm, mean, 3.00 mm. Overall similar to male's general color through somewhat lighter; posterior declivity of carapace with two contiguous, or nearly so, brown maculations; spines on carapace subspatulate. Abdomen with a more diffuse pattern than male. Epigynum as in Figs. 10, 13.

Range–Southeastern United States extending northward into New England and southern Ohio (see Map 1).

Localities–*Florida*: Liberty Co.; Alachua Co.; Baker Co.; Leon Co.; Marion Co.; Duval Co.; Pinelas Co.; Highlands Co.; Polk Co.; Charlotte Co. *Georgia*: Daugherty Co.; Baker Co.; Thomas Co.; Clark Co.; Bartow Co.; Charlton Co.; Mitchell Co.; Thompson's Mill; Oconee Forest. *Alabama*: Lee Co.; Shelby Co. *Texas*: Sabine Co. *Arkansas*: Calhoun Co.; Grant Co.; Ashley Co. *Mississippi*: Greene Co. *Louisiana*: Caddo Parrish. *South Carolina*: Pickens Co.; Abbeville Co. *Virginia*: Giles Co.; Fall's Church. *Maryland*: Prince Co. *New Jersey*: Ocean Co.; Suffolk Co.; Nassau Co. *Ohio*: Hocking Co.; Franklin Co.

Diagnosis and comments–The brown stripe on the ventral surface of the legs and the nearly straight anterior eye row along with the subspatulate spines and contiguous maculations on the carapace of the female serve to separate *floridana* from other North American species.

This is an interesting species in that although it differs quite obviously from *utahensis* in appearance, the structure of the epygina of the two species is virtually identical.

Coriarachne versicolor Keyserling

Coriarachne versicolor Keyserling, 1880, Die Spinnen Amerikas, Laterigradae, 1:53, Pl. 1, Fig. 27. Gertsch, 1939, Bull. Amer. Mus. Nat. Hist. 76:405, Figs. 254, 255, 269. Gertsch, 1953, Bull. Amer. Mus. Nat. Hist. 102:458, Figs. 60, 61 and 64. Roewer, 1954, Katalog der Araneae, 2 (Pt. 2):1206. *Xysticus versicolor*, Simon, 1895, Histoire naturelle des Araignees, 1(2):1035.

Bassania aemula P.-Cambridge, O., 1898, Biol. Cent.-Amer., Arachnida, Araneida, 1:249, Pl. 31, Figs. 5, 5a-5f. NEW SYNONYM.

Bassaniana aemula, Strand, 1928, Arch. Naturg. 92A(8):30.

Platyxystucys utahensis Gertsch, 1932, Amer. Mus. Novit. 563:3 (in part: paratypes from Zion Nat'l. Park; not holotype). NEW SYNONYM.

Platyxysticus versicolor, Gertsch, 1932, Amer. Mus. Novit. 563:3. Fig. 1.

Xysticus banksi Gertsch, as used by Chickering and Bacorn, 1933, Papers Mich. Acad. Arts, Sci. and Letters, 17:523.

Coriarachne lenta Chamberlin and Ivie, 1944, Bull. Univ. Utah Biol. serv., 8(5):156. NOMEN DUBIUM.

Coriarachne aemula, Gertsch, 1953, Bull. Amer. Mus. 102:459, Figs. 67, 68.

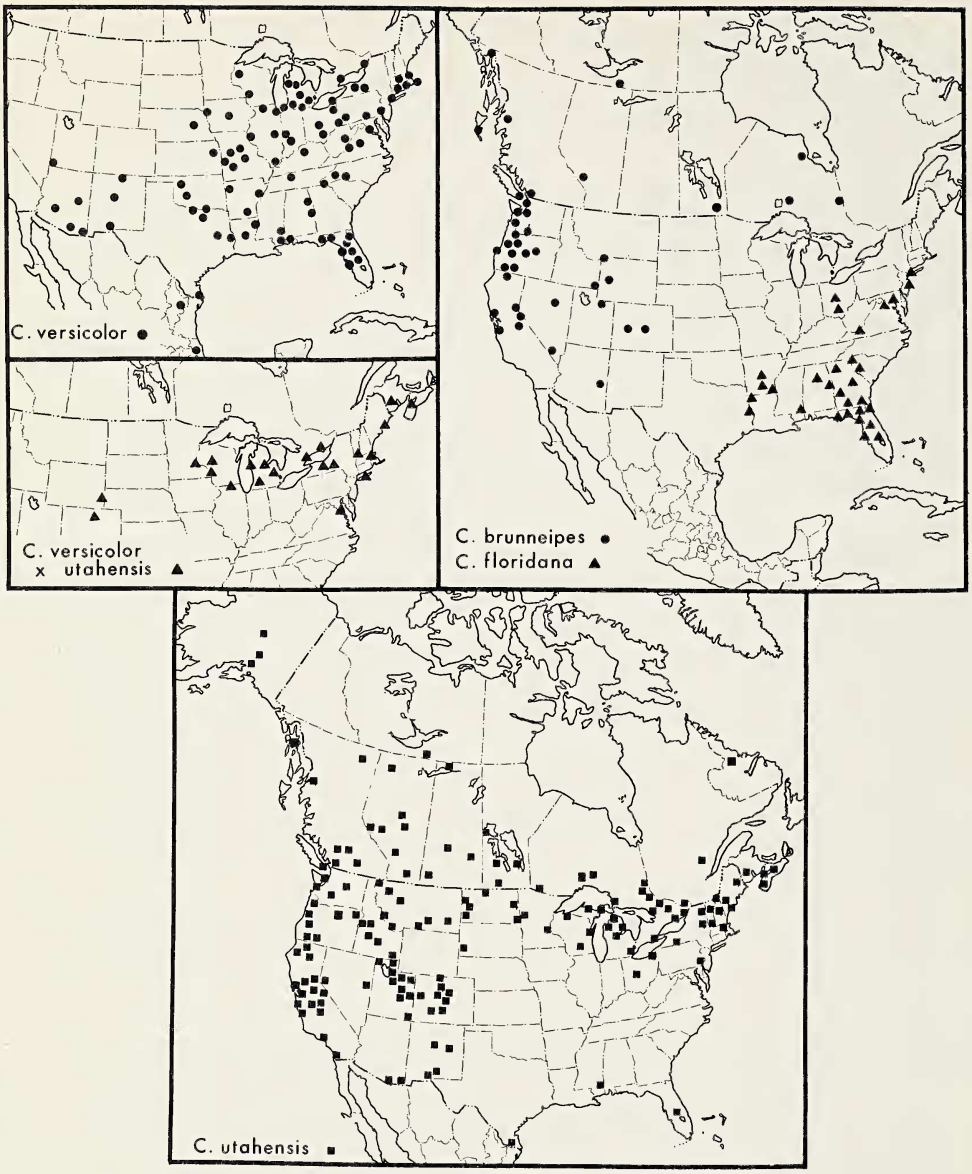


Fig. 22.–Distribution of *Coriarachne spp.* in North America north of Mexico.

Type–Syntypes of *C. versicolor* from Mariposa, California; Boston, Massachusetts; Peoria, Illinois; and Georgia. Syntypes from Georgia in British Museum of Natural History, others in Museum National d'Histoire Naturelle of Paris. Lectotype and paralectotypes are designated here by the authors from Keyserling's syntypes from Georgia deposited in the British Museum of Natural History. This designation was made since from the Georgia material alone there were three different species, all called *vesicolor* by Keyserling. Female type of *aemula* from Orizaba, Veracruz, Mexico was reported by Gertsch (1953) to be in the British Museum of Natural History. Communication with the curator, Mr. Keith Hyatt, reveals it is no longer there and presumably lost.

Male–Total length, 3.92-5.75mm, mean 4.72 mm: cephalothorax length, 2.04-2.96 mm, mean, 2.35 mm; width, 2.20-3.00 mm, mean, 2.49 mm. Carapace similar to that of *floridana* in color, more convex, anterior eye row definitely recurved. Setae filiform. Legs mottled around entire circumference. Abdomen as in *floridana*. Palp as in Figs. 6, 7.

Female–Total length, 4.42-7.67 mm, mean, 5.77 mm: cephalothorax length, 3.24-3.92 mm, mean, 3.52 mm; width, 2.32-3.24 mm, mean 2.67 mm. Overall similar to male, though somewhat lighter, mottling more diffuse on carapace and abdomen. Epigynum as in Figs. 19, 20, 21.

Range–Eastern United States and southern Ontario westward to the Rocky Mountains, in the Southwest as far as western Arizona also extending into eastern Mexico at least as far as Orizaba, Veracruz (see Map 1).

Diagnosis and comments–*C. versicolor* and the following species, *utahensis*, are very similar with respect to coloration and spination. However, *versicolor* males have a longer embolus than their *utahensis* counterparts as a comparison of Figs. 6, 7 with Fig. 8 will show. It should be noted that in addition to the sclerotized truncus varying in length between the two species, the length and position of the pars pendula also varies. In *versicolor* it extends from 260°-270° to 340°-350°, whereas in *utahensis* it extends from 270°-280° to 360°-380°.

Females can be separated by the length of the copulatory tubes. In *versicolor* the tubes are well exposed and long (Figs. 20, 21). *C. utahensis* has much shorter copulatory tubes which are not visible or only slightly so. A second character that sometimes is of some value is the width of the septum, it being typically wider in *utahensis* than in *versicolor*. This is not completely reliable, however, and can lead to misidentification as was the case with Gertsch (1932). Specimens he used as paratypes of *utahensis* from Zion National Park indeed looked similar to the typical septum of *utahensis*. Examination of the spermathecae and copulatory tubes showed, however, that these spiders were actually *versicolor*.

Gertsch (1953) was the first to realize that *Bassania* O. P.-Cambridge was a synonym of *Coriarachne*. At the time, he left the single species of the genus, *aemula*, as a valid species of *Coriarachne*. As was mentioned earlier, the type of *aemula*, a female, could not be located. Therefore, specimens from Mexico determined by Gertsch as *aemula* and figures by O. P.-Cambridge (1898) were relied upon for characters to compare with *versicolor*. Examination of these representatives showed no consistent differences between the two species. Consequently, *aemula* is treated here as a synonym of *versicolor*.

The male associated with *aemula* is described by Gertsch (1953) as being quite similar to *utahensis*, differing only on the angle of the spur on the retrolateral apophysis of the palp. This character has been found to be quite unreliable. Therefore, the placement of this male must be regarded to be in error and actually represents an extension of the range of *utahensis*.

There has been a recurring problem of nomenclature associated with *versicolor*. Occasionally in the literature one finds *C. lenta* (Walckenaer) as a senior synonym of *versicolor*. The description of *Coriarachne lenta*, (Walckenaer), like many of Walckenaer's, was based on drawings of spiders from Georgia by John Abbot. In personal communication, Dr. C. D. Dondale advises that neither Abbot's drawings nor Walckenaer's description is clear enough to tell what species is being dealt with - *versicolor*, *utahensis*, or *floridana*. In fact it may not even be *Coriarachne*. For this reason *Coriarachne lenta* (Walckenaer) must be regarded as a nomen dubium.

Coriarachne utahensis (Gertsch)

Platyxysticus utahensis Gertsch, 1932, Amer. Mus. Novit. 563:5, Fig. 2. (in part: not paratypes from Zion Natl. Park).

Coriarachne utahensis, Gertsch, 1939, Bull Amer. Mus. Nat. Hist. 76:408. Gertsch, 1953, Bull. Amer. Mus. 102:460, Figs. 62, 63. Roewer, 1954, Katalog der Araneae, 2 (Pt. 2):833. Bonnet, 1956, Bibliographia Araneorum 2(Pt. 2):1206. Schick, 1965, Bull. Amer. Mus. 129:169, Figs. 250-252.

Type–Salt Lake City, Utah, male holotype, female allotype, and male and female paratypes; Bluff, Utah, female paratypes; Zion National Park, female paratypes (actually *versicolor*). Types in American Museum of National History collection, examined.

Male–Total length, 4.08-6.25 mm, mean, 4.65 mm: cephalothorax length, 2.12-3.80 mm, mean 2.68 mm; width 1.12 -3.00 mm, mean 2.49 mm. Structure and color essentially identical to *versicolor*. Palp as in Fig. 8.

Female–Total length, 4.50-9.92 mm, mean, 6.28 mm: cephalothorax length, 2.12-3.80 mm, mean, 2.68 mm; width, 2.20-3.80 mm, mean 2.79 mm. Coloration is essentially the same as *versicolor*. Epigynum as in Figs. 12, 15, 18.

Range–Trans-Canadian and northern United States, along Gulf coast states from Florida into Mexico, also from central Alaska south along mountain ranges into Mexico (see Map 1).

Diagnosis and comments–Males can be identified by the short embolus and recurved anterior eye row. Females are distinguished by the maculations on the posterior declivity being separate, anterior eye row recurved, and copulatory tubes barely, if at all, visible.

Often in areas where the range of *utahensis* overlaps with *versicolor* a form occurs that has genitalia characteristics intermediate to those two species (see Figures 9, 11, 14). Since both parental forms and the intermediate have been recorded from the same area (see Map 1), it is likely that this intermediate is a hybrid resulting from cross-breeding of *versicolor* and *utahensis*.

ACKNOWLEDGMENTS

We would like to thank the following institutions and persons for contributions toward the completion of this work: Mr. K. Hyatt of the British Museum of Natural History for sending Keyserling's syntypes of *Coriarachne versicolor* for examination; Dr. J. A. L. Cooke of the American Museum of Natural History for sending paratypes of *Coriarachne utahensis* (Gertsch) with the rest of their loan material; and Dr. D. Barr of the Royal Ontario Museum for types of *Coriarachne nakina* Gertsch.

We also wish to acknowledge the following for loan material: Dr. H. W. Levi, Museum of Comparative Zoology; Professor M. Vachon and Dr. M. Hubert, Museum National d'Histoire Naturelle, Paris; Dr. R. L. Fischer, Michigan State University; Dr. J. R. Tripp, Southern Florida College; Dr. C. D. Dondale, Canadian National Collection of Insects and Arachnids; Dr. W. B. Peck, Central Missouri State University; Dr. G. F. Edmunds, University of Utah; Dr. B. R. Vogel, Texas Memorial Museum; Dr. R. X. Schick, California Academy of Science; Dr. M. Prokop, Field Museum of Natural History; Dr. W. A. Drew, Oklahoma State University; Dr. R. L. Post, North Dakota State University, D. B. Richman, University of Arizona; Dr. C. A. Triplehorn, Ohio State University; the late Dr. L. J. Bayer, University of Wisconsin; D. J. Buckle; and T. R. Renault.

Special appreciation is extended to Dr. C. D. Dondale, who suggested this project, for his helpful advice and constant encouragement.

LITERATURE CITED

Bonnet, P. 1945-1961. Bibliographia Araneorum I-III. 832 pp. (I); 591 pp. (III). Imprimerie Douladoure, Toulouse.

Gertsch, W. J. 1932. A new generic name for *Coriarachne versicolor* Keyserling, with new species. Amer. Mus. Novit. 563:1-7.

Gertsch, W. J. 1939. A revision of the typical spiders (Misumeninae) of America north of Mexico. Bull. Amer. Mus. 76:277-442.

Gertsch, W. J. 1953. The spider genera *Xysticus*, *Coriarachne* and *Oxyptila* (Thomisidae, Misumeninae) in North America. Bull. Amer. Mus. Nat. Hist. 102:413-482.

Homquist, A. M. 1926. Studies in arthropod hibernation. I. Ecological survey of hibernating species from forest environments of the Chicago region. Ann. Ent. Soc. America 19:395-428.

Jennings, D. T. 1972. An overwintering aggregation of spiders (Araneae) on cottonwood in New Mexico. Ent. News 83:61-67.

Kaston, B. J. 1948. Spiders of Connecticut. Bull Conn. St. Geol. Nat. Hist. Surv. 70:1-874.

Lowrie, D. C. 1948. The ecological succession of spiders of the Chicago area dunes. Ecology 29:334-351.

Pickard-Cambridge, O. 1898. Biol. Cent.-Amer., Arachnida, Araneida. 1:233-288.

Roewer, C. F. 1942-1954. Katalog der Araneae I-II. 1040 pp. (I); 1751 pp. (II). Bremen and Brussels.

Schick, R. X. 1965. The crab spiders of California (Araneida, Thomisidae). Bull. Amer. Mus. Nat. Hist. 129:1-180.

Yaginuma, T. 1970. The spider fauna of Japan. Bull. Natl. Sci. Mus. 13:639-701.